rainfall. The climate of Cyprus is first discussed (p. 35) on account of its contrast with that of Mongonui in New Zealand. The world-wide view of phenomena is never absent, and a pupil who reads these pages will cease to regard the British Empire as so many isolated red patches on a map.

The various divisions of the Empire are arranged according to their climatic conditions. British Columbia is thus treated, as having a "maritime temperate climate," apart from Canada east of the Rockies, which "may be more justly compared with eastern Europe and temperate Asia." Agriculture and forestry are properly regarded as the fundamental industries that depend on climate, and many interesting statements are made as to the modes in which labour-difficulties have been met. The questions and exercises encourage further reading; we are, for instance, asked to consider the right food for our coolies, and what we should sell, as Egyptian peasants, in order to pay our taxes. We have noticed only one tiny slip; the question on p. 333, "Why do you think the islanders rejoice so greatly when this worm appears?" does not quite express the meaning of the author.

(2) Dr. Mort describes the British Isles in the modern manner that now appeals to secondary schools, and his references to the geological structure of the country are sufficient to lead the pupil to ask for more. In later work a school may well use the volume on the geography of its own county provided by the same educational press, and it will be found that Dr. Mort has laid a good foundation for more detailed local study. References to castles and the holding of gaps make us inclined to think that more might be made of the influence of structural features upon British history. No young mind that can appreciate the rise of the industries of Sheffield or of ship-building on the Clyde should remain unmoved at Portnaspania or the Roman Wall. The references to the Devon seamen (p. 133) are admirable. The illustrations are well selected to show varied types of scenery. The scarped plateau of Ben Bulben (Fig. 79) is due to limestone, and not, as is stated, to Millstone Grit.

(3) Mr. Macnair's acquaintance with the geology as well as the antiquities of his country makes him an excellent guide to the mountainous lands of Argyll and Bute. This volume of the Cambridge Geographies is issued with rounded corners, and is thus all the better as a companion for the numerous travellers who start from Glasgow for the sea-lochs and the isles. General considerations are introduced in the earlier pages, and we notice that the author, while laying stress on glacial erosion, points out that the fiords have been developed "along the geological grain of the country," and sometimes across this grain. He does not, however, refer to the probability of the weakening of the land by cross-fractures before the ice-action set in. We are glad to see an Oligocene rather than an Eocene age assigned (p. 22) to the Cainozoic lavas. The account of the geology of Arran is also well brought up to date. In the index to the geological map, however, the word "chalk" should be "Cretaceous"; and should not "ferriferous," on p. 59, be "ferrous"?

The diminution of the highland population through the attraction of other fields is strikingly seen in the fact that Argyll, on the edge of the prosperous Central Valley, has lost 30 per cent. of its population since 1831. The county was long a battle-ground, owing to its position between the lowland and the western isles, and the author well remarks that perhaps the greatest date in its history was the arrival of Columba at Iona in 563.

(4) London remains the home of sincere amateurs in natural history, and the quiet woods and byways on the edges of its basin in these days tempt the walker more and more. Mr. Davies guides us from convenient railway-stations to view-points or famous sections where we may appreciate the structure of the hills. A good coloured geological map is given as a frontispiece, and this handy book should soon become known to London students, and also to visitors from the Continent.

G. A. J. C.

NATURE STUDY FOR SCHOOL AND HOME.

(1) *A First Course in Plant and Animal Biology.* By W. S. Furneaux. Pp. viii+232. (London: University Tutorial Press, Ltd., 1914.) Price 2*s.*

(2) *A First School Botany.* By E. M. Goddard. Pp. xiii+191. (London: Mills and Boon, Ltd., 1914.) Price 2*s.* 6*d.*

(3) *Pond Problems.* By E. E. Unwin. Pp. xvi+119. (Cambridge: University Press, 1914.) Price 2*s.* net.

(4) *Wild Life in the Woods and Streams.* By C. A. Palmer. Pp. xv+206. (London: A. and C. Black, 1914.) Price 3*s.* 6*d.*

(5) *The English Year: Summer.* By W. B. Thomas and A. K. Collett. Pp. viii+341. (London: T. C. and E. C. Jack, 1914.) Price 10*s.* 6*d.* net.

TO-DAY the junior student of biology has his attention directed to function and behaviour, rather than to those structural features which claimed almost exclusively the interest of his predecessors of thirty years ago. This modern tendency is shown in the batch of books now before us.

(1) Mr. Furneaux, introducing his lesson-book for school-classes, tells us that his work "deals with living nature rather than with dead objects." Beginning with Amœba and the Yeast, he passes first to plant life, as illustrated by fern and flowering plant, and then to animal life, so far as it can be demonstrated by short lessons on butterfly, frog, pigeon, and a few common mammals. The grosser structure of flowering plants is discussed at some length; in the zoological section attention is directed chiefly to what may be seen by the pupils as they watch the living creatures. Indeed, the anatomical information is almost too meagre to be of use, and the classificatory schemes are faulty; for example, eagles and owls are placed in the same order of birds, while among the mammals the Ruminants are separated ordinally from the Ungulata, which are said to include the horse, ass, and swine! The book concludes with a chapter on human physiology extending to 25 pages. Distinctly useful as the book may prove to an earnest teacher, it leaves the impression of an attempt to include too much in the space allotted.

(2) Miss E. M. Goddard's book, "written to provide a course in elementary botany for the middle forms," and admittedly intended to be "useful to students preparing for examination," gives an excellent combination of practical exercises and clear explanations, illustrated by good, bold outline drawings. The pupil who works conscientiously through the physiological experiments, and laboratory and field observations described in this small volume will have won something better than examination successes—a well-grounded foundation for future study of plant life. On page 46 there is a curious slip of "corm" for "bulb," in a paragraph distinguishing these two favourites of the botanical examiner, which may puzzle the intending examinee.

(3) In "Pond Problems," Mr. E. E. Unwin has produced a noteworthy educational work. He deals only with aquatic insects, and no naturalist who appreciates the mode of treatment adopted will be surprised to find that the method of teaching was learned in the laboratory of Prof. L. C. Miall. Mr. Unwin has, indeed, given his fellow-teachers the benefit of his own lesson-notes. The nature of his method will best be realised from the fact that in 100 pages there are 397 questions, to most of which the pupils are left to find answers from their own observations. All the drawings and most of the photographic illustrations are excellent. Hints are given for the construction of simple but efficient pieces of apparatus, and the boys or girls who are fortunate enough to be taken through the course on the lines indicated will enjoy a "good time." Is it not a mistake to use the term "skin"—even with quotation marks and explanations—for the chitinous exoskeleton of an arthropod? Why not write "cuticle," and thus familiarise the student from the beginning with the essential difference between the secreted envelope and the true skin which forms it?

(4) With Mr. C. A. Palmer's contribution we pass from school-books to a play-book, for he has written a series of bright chatty notes on common animals in the form of letters to a young boy. Many of these are thrown into the anthropomorphic story-sketch which has been popular of late years, both in the United Kingdom and in America. The somewhat slight letterpress is illustrated by attractive drawings. Although the scene of "Dad's" zoological researches is ostensibly an English county, he describes and figures the trap-door nest of a Nemesia, which raises a certain degree of scepticism with regard to his other stories.

(5) Messrs. Thomas and Collett have produced a volume of popular natural history for the drawing-room, which in literary form, typographical finish, and illustrations is "a thing of beauty." The black and white sketches—drawn by Mr. A. W. Seaby—are mostly admirable, and there are some attractive reproductions in colour of notable landscapes, though a plain naturalist, with an old-fashioned preference for clear drawing, is grateful for the printed information that one of them represents "building the Rick"; "Digging out the Sand-pit" would have been equally credible as a title. The book is made up of a series of short chapters describing phases of country life through the months of June, July, and August. Animals and plants are discussed in relation to their surroundings, and the authors see birds and flowers with the artist's eye. The passion for the open so pervades the book that it will surely drive some readers "Along the River" and "Among the Grasses," if not "Below the Tidemark." In some of their explanations the authors are too dogmatic. Our British species of Erebia, for example, are not surviving members of "the Arctic fauna which flourished here in the Ice Age." They both belong to the distinctively Alpine group which is southern rather than northern in its affinity, and neither is to be found in the Arctic regions. The studies of bird and plant life are generally good, and the drawings of birds—at rest or in flight—are excellent, as are most of the plant sketches. In

the chapters devoted to insects, however, there are signs of want of touch between authors and artist. In the chapter on "Butterfly Flight" there is a drawing of a "Fritillary," which represents the plant, not the insect of that name; the 'Little Blue resting," on p. 35, appears to have been drawn from a "Common Blue," while the "Female Emperor," on p. 104, is unmistakably *Arctia caia,* the "Common Tiger" moth. Such slips as these can, however, be easily rectified in a new edition.

G. H. C.

PRACTICAL DRAWING.

(1) *A Manual of Mechanical Drawing.* By J. H. Dales. Pp. xii+181. (Cambridge University Press, 1914.) Price 3*s.* net.

(2) *Machine Construction and Drawing.* Book ii. By A. E. Ingham. Pp. xii+180. (London: G. Routledge and Sons, Ltd., 1914.) Price 3*s.* net.

THE titles of these two books have been well chosen; in one the chief concern of the author is to ensure manipulative skill in instrumental *drawing,* and in the other to illustrate details of engineering *construction.*

(1) Those readers who take Mr. Dales as their guide will undergo a process of careful drilling in the use and maintenance of the scale, square, pencil, pen, and compass, by means of specially designed and carefully graduated sets of exercises, largely geometrical in character, followed by examples of the projection of various machine details, and completed by the preparation of a full set of working drawings of a screw-cutting lathe, fully dimensioned, with titles and descriptions, all executed in the style of the skilled professional draughtsman. Thus the book gives a course of organised training in the draughtsman's craft, valuable especially to students who afterwards enter a drawing office, for they will be ready to begin elementary design or other good work at once.

(2) Mr. Ingham has previously written an elementary book on the subject, and the present volume is intended as a continuation, suitable for more advanced students. It gives, with descriptions and simple calculations, a large number of well-selected examples representing modern engineering practice, arranged and classified in seven chapters headed respectively, "Power Transmission Appliances," "Gearing," "Steam Engines and Turbines," "Gas and Oil Engines," "Boilers and Fittings," "Machine Tools and Appliances," "Pumps and Compressors." The drawings are well printed and thoroughly workmanlike and have evidently been prepared by a highly qualified expert. The student's progress is tested from time to time by sets of suggestive examples in drawing, calculation, and design. The text-book is a very good example of its kind, and will give satisfaction wherever adopted.

OUR BOOKSHELF.

Essays and Addresses. By the late Prof. James Campbell Brown. Pp. x+208. (London: J. and A. Churchill, 1914.) Price 5*s.* net.

Mr. Henry H. Brown, who edits this volume, explains in the preface that this selection of essays and addresses has been published because of the many requests for copies of particular papers by the late Prof. Brown which Mrs. Campbell Brown has received but was unable to accede to because most of the essays had never been printed.

The papers are arranged in chronological order, and most of them are concerned with various aspects of pure and applied chemistry. The first, on technical chemistry, was the chairman's address to the Liverpool section of the Society of Chemical Industry, and was delivered in November, 1886. The last essay, on science applied to the detection of crime, was an address to the chemical, physical, and legal societies at the University of Liverpool in 1908. The scope of the volume can be gathered from the titles of some of the other papers: the ethics of chemical manufacture, a French view of German industries, the use and abuse of hypothesis, and chemistry as a profession.

The papers have been printed as nearly as possible in the shape in which they were delivered, and will be welcomed by their author's old pupils and friends, who will recognise many characteristic touches.

The Happy Golfer. Being some Experiences, Reflections, and a few Deductions of a Wandering Player. By H. Leach. Pp. vii+414. (London: Macmillan and Co., Ltd., 1914.) Price 6*s.* net.

This is a brightly written book, full of the free air of the links and the sweet philosophy of the man who enjoys the simple life of the natural athlete. The author discovers in golf seven wonders, the fascination that grips, the traditions which never stale in the telling, the ubiquity of the game, St. Andrews the sacred Mecca of every golfing soul, the tragedy of the short putt, the three mighty men who share fifteen open championships among them, and the marvellous amateur eight times champion, and, lastly, the romance of the rubber-cored ball. On these as texts he dilates and prattles, then takes us all round the world searching for happy golfing hunting-grounds, returning finally to the best heaven-given links of the dear homeland. He talks of players and matches, of temperament and style, of courses and hazards. When he touches on what is generally called the science of the game he speaks wisely and not dogmatically. Not a single illustration of stance or grip disturbs the literary glamour of the page; and the mysteries